Nonmarine Mollusks of Rongelap Atoll, Marshall Islands

NORMAN J. REIGLE[1]

IT HAS LONG BEEN realized that the coral atolls and low islands of the Pacific possess a meager, limited, and characteristic snail fauna which are of little zoogeographical value (Pilsbry; 1900, 1916, Cooke; 1926). Cooke (1934) has described the terrestrial molluscan fauna of one of the typical lower islands; and recently Solem (1959) has listed the major molluscan elements of the atoll fauna.

In recent years the Marshall Islands served as a center for United States atomic testing. This large operation brought about many changes in the life of certain islands, including mass shiftings of human populations. In view of the possible influence of population movements and of testing on the fauna of an area, it might be helpful to record the available distribution records, not only to learn what is happening to the mollusks in the course of the nuclear tests but also to obtain a better knowledge of the fauna in this area.

Published records of nonmarine mollusks in the Marshall Islands are very scarce. Although this group is composed of 32 islands and 867 reefs (Robson, 1946), the nonmarine mollusks of only 2 of the islands have been reported. The Marshalls are a homogenous series of islands, with the highest elevation about 33 ft (Osborn, 1944). Consequently, these islands lack the more interesting and diverse land snails which are found on the higher islands, and it is not surprising that little has been written about this vast area.

Pease (1860) described six new species from Ebon which have since been reduced to two (see Cooke and Kondo, 1960: 180–191; H. B. Baker, 1940: 190; Pilsbry, 1917:151–152). Schnee (1904) listed three land snails and one oncidiid slug from Jaluit. His paper was concerned primarily with vertebrates and only a few mollusks were collected. Since the paper of Pease from which most of the published Marshall Island records have been derived contains only descriptions of new species, and the Schnee records are only incidental, it is apparent that these records are incomplete. Recently *Omphalotropis fragilis* Pease has been recorded on two of the atolls (Marshall, 1950); and Abbott (1958) described a new subspecies from Eniwetok and also recorded it from two neighboring atolls, including Rongelap. Cooke and Kondo (1960), in their revision of the Tornatellinidae and Achatinellidae, supplied additional records for the area. Several records from the "Marshall Islands" which really refer to Nauru, stem from a paper by O. Boettger (1904). Prior to 1914 this island was part of the German Marshall Islands Protectorate, but is not generally considered geographically a part of the Marshall Islands.

Rongelap Atoll, also known under the names of Rimski-Korsakoff I., Rongelab, Rongorappu To, and Pescadore, is located in the northeastern portion of the Marshall Islands at 11° 20′ N, 166° 50′ E (Fig. 1). A general description and more complete maps of Rongelap and neighboring atolls, of Bikini, Eniwetok, and Rongerik, were published by Taylor (1950).

The land snail fauna of Rongelap is typical of a Pacific atoll. As one would suspect, all of the species have a wide range of distribution in the Pacific. The only exception is one subspecies, thus far recorded only from the Marshall Islands (Abbott, 1958). The various species recorded were unequally distributed on the islands. Of the 10 species mentioned here, 6 represent new records for the Marshall Islands.

MATERIAL STUDIED

This study was based upon a collection made in September 1959 by Dr. I. Eugene Wallen, aquatic biologist with the Atomic Energy Commission. Collections were made on five islands in the atoll, and most were made within 150 ft from shore. Of the 450 specimens collected,

[1] Museum of Zoology, University of Michigan, Ann Arbor, Michigan. Manuscript received August 13, 1962.

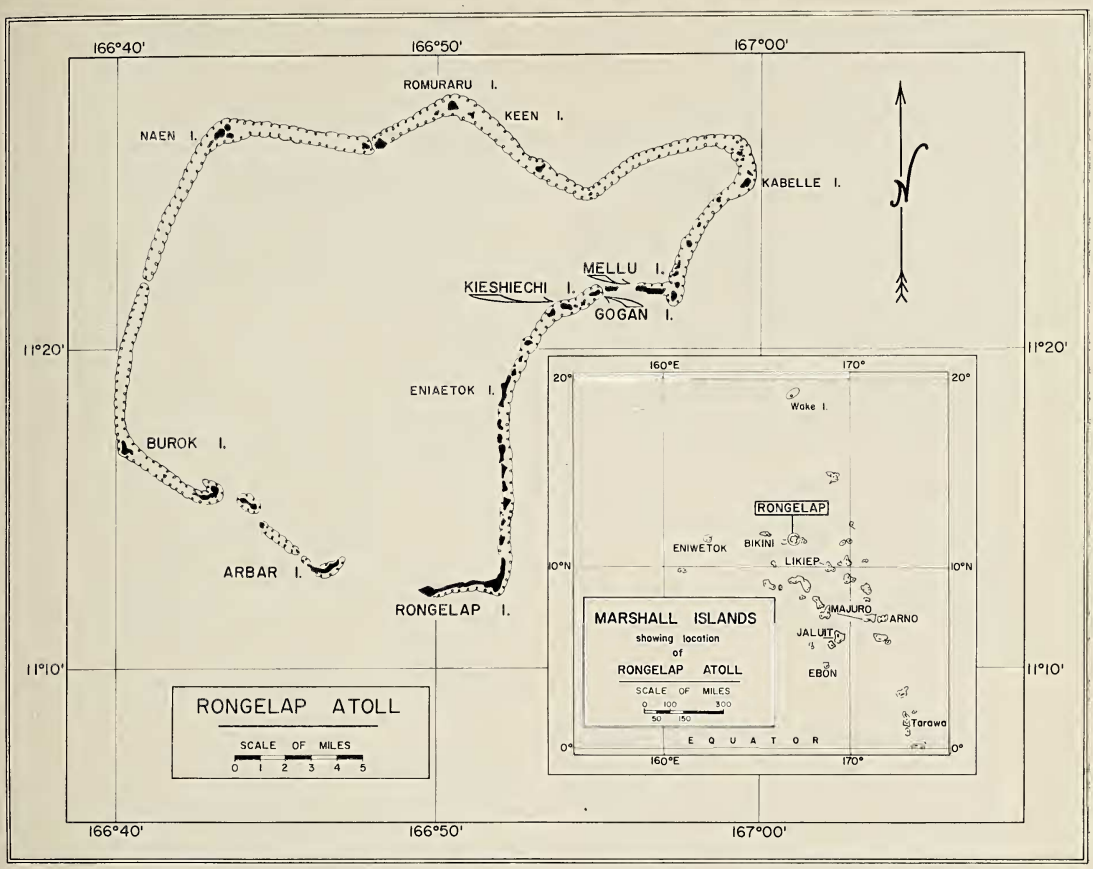

FIG. 1. Map of Rongelap Atoll, showing collecting localities and principal islands (after Taylor, 1950). Insert shows position of Rongelap Atoll in the Marshall Islands.

two-thirds were found alive. This collection was presented to Dr. Henry van der Schalie, who was working on Eniwetok at that time. The Rongelap collection was later given to the author for study. In addition one lot of shells containing two species was collected by Dr. van der Schalie on the island of Japtan, Eniwetok Atoll. Four lots of Marshall Island nonmarine snails were contained in the University of Michigan Museum of Zoology collection. One of these is a new locality record.

The material examined has been deposited in the University of Michigan Museum of Zoology, and representative Truncatellidae were placed with the Museum of Comparative Zoology, Harvard University.

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SYSTEMATIC LIST

The nonmarine snail fauna collected by Dr. Wallen on Rongelap Atoll comprised the following species:

Family Ellobiidae

Melampus luteus Quoy and Gaimard
Marshall Islands records: none.
Distribution on Rongelap: Mellu; only 2 living specimens.

Melampus fasciatus Deshayes
Marshall Island records: none.
Distribution on Rongelap: Mellu; 18 living specimens.

Family Pupillidae

Gastrocopta (*Sinalbinula*) *pediculus* (Schuttleworth)
Marshall Island records: Ebon (Pease, 1860).
Distribution on Rongelap: Arbar, Gogan, Burok, and Mellu.

This snail was the most abundant on the atoll and comprised nearly 50% of the shells collected. Live specimens were taken at each of the stations listed. It was found commonly on and around dead coconut leaves. One specimen was collected by Dr. van der Schalie on the island of Japtan, Eniwetok Atoll.

Family Tornatellinidae

Lamellidea pusilla (Gould)
Marshall Island records: Ebon (Pease, 1860; Pilsbry and Cooke, 1915–1916).
Distribution on Rongelap: Arbar, Gogan, and Mellu.

Although *Lamellidea* was not abundant at any of the stations, the series (including a number of juveniles) was large enough to make a satisfactory determination. Pease's *Tornatellina nitida* and *Lamellidea serrata* belong with this species (Cooke and Kondo, 1960:190).

Family Helicarionidae

Liardetia (*Liardetia*) *samoensis* (Mousson) (= *striolata* Pease)
Marshall Island records: Ebon (Pease, 1860).
Distribution on Rongelap: Gogan; only 10 dead specimens were found.

Family Subulinidae

Lamellaxis (*Allopeas*) *gracilis* (Hutton)
Marshall Island records: none.
Distribution on Rongelap: Arbar, Gogan, Burok, and Mellu.

Although this widely distributed snail was found on four of the five islands, visited, it was not abundant on any of the islands and represented only 6% of the whole collection. Living specimens were taken from Gogan and Mellu. Dr. van der Schalie also collected a series of live *L. gracilis* on the island of Japtan, Eniwetok Atoll.

Family Truncatellidae

Truncatella (*Truncatella*) *guerinii* A. and J. B. Villa (= *valida* Pfeiffer)
Marshall Island records: none.
Distribution on Rongelap: Mellu and Keishiechi.

T. guerinii was very commonly collected on two of the islands and comprised one quarter of the collection. It was found living at both stations.

Truncatella (*Truncatella*) *granum* Garrett
Marshall Islands records: none.
Distribution on Rongelap: Arbar; 5 specimens, 2 living, were found.

Family Assimineidae

Assiminea nitida marshallensis Abbott
Marshall Island records: Bikini, Eniwetok, Rongelap (Abbott, 1958).
Distribution on Rongelap: Enybarbar, Arubaru, Mellu, Aruboru (Abbott, 1958), Arbar.

This species was collected commonly on Arbar. Of the 56 specimens examined only 1 had attained the maximum growth that is characteristic of this subspecies.

Assiminea cf *hidalgoi* Gassies
Marshall Island records: none.
Distribution on Rongelap: Arbar.

Eight specimens of *Assiminea,* which closely resemble New Caledonian specimens of *A. hidalgoi,* were found with *A. nitida marshallensis. A. hidalgoi* is a part of a widespread but, as yet, unclarified complex of species (Abbott, 1960). Since the systematics of the species outside the Philippines are in a confused state, it seems best not to assign a definite identification to the species in question. The radula formula observed in these specimens is: centrals $\frac{4–1–4}{0–0}$ to $\frac{5–1–5}{0–0}$; laterals 6–1–7; inner marginals 9–10; outer marginals 15+.

ADDITIONAL RECORDS

The following nine species have been reported from the Marshall group but were not

collected on Rongelap. Some of these records may not be valid.

Oncidium "(*verruculatum* Cuvier?)." Jaluit (Schnee, 1904). This record probably refers to *O. peronii* Cuvier, a species Hoffman (1929) mapped as occurring in the Marshall Islands, while he excluded the former species.

Pupina complanata (Pease). Ebon (Pease, 1860).

Assiminea nitida nitidula Thiele. Jaluit (Thiele, 1927).

Subulina octona (Bruguiere). Jaluit (Schnee, 1904).

Omphalotropis fragilis Pease. Ebon (Pease, 1860), Likiep and Arno (Marshall, 1950). There are also three specimens from Jaluit in the Museum of Zoology, University of Michigan collection.

Tornatellides simplex Pease. Ebon. This isolated record outside of the general distribution is discussed by Cooke and Kondo (1960:26).

Tornatellinops sp. Included in a map by Cooke and Kondo (1960, Figs. 6 and 78).

Elasmias "(*apertum* Pease)." Arno and Majuro (Cooke and Kondo, 1960).

Elasmias manilense (Dohrn). Jaluit (Schnee, 1904). The specific identity of the Marshall Island *Elasmias* is apparently not yet definitely established; hence this record is questionable.

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